THE PLANT DISEASE REPORTER

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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XX March 15, 1936 Number 5

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NECTRIA CANKER OF PEAR

S. M. Zeller, Plant Pathologist, Oregon Experiment Station,
and L. P. Wilcox, Field Adviser, Southern Oregon Sales, Inc.

One would not usually expect to find the canker organism, Nectria galligena Bres., attacking bark tissues below the surface of the soil. Such a case, however, came to our attention in the fall of 1931. This was in a pear orchard belonging to Mr. Vilas, seven miles north and east of Medford, Oregon. The soil in this orchard is the heavy clay adobe, characteristic of much of the pear-orchard land in the Rogue River Valley.

In the early spring of 1930 Mr. Vilas planted twenty-six acres consisting of 260 trees of the Bartlett variety and 1430 trees of the D'Anjou variety. These were planted in alternating six rows of D'Anjou and two rows of Bartlett. All the nursery stock was standard trees budded on French roots.

The first sign of canker was noted in the fall of 1931. The cankers started near the base of the tree running up the young trunks for a few inches and down below the soil surface for several inches. At first the canker was superficial but it soon penetrated to the cambium, especially just below the soil. Many trees were more or less girdled by the crown cankers.

The infected bark was found to be rather water-soaked and sometimes with sap oozing from the surface both above and below the soil line. Wherever crevices were found in the bark or the latter was separated from the wood, such cavities usually exhibited pustules of the imperfect stage (Cylindrocarpon mali) of the canker organism. No other parasitic fungi or bacteria were cultured from infected tissues, but cultures yielded 42 per cent Nectria and 58 per cent contaminating Penicillia, etc.

To treat a canker the soil was removed from the crown to a line well below any apparent infection. All diseased tissue was removed by cutting and scraping clean where the infection had reached the wood, and by scarifying the bark where the infection was superficial only. The wounds were then daubed with Bordeaux paint. (See Ore. Agr. Exp. Sta. Circ. 73:29. 1926,) Beginning in the fall of 1932 and each fall thereafter, all trunks and crowns were sprayed with Bordeaux 5-5-50, prior to the fall rains.

The losses of trees were as indicated in the following tabulation.

Year	Number of trees lost		Number of trees having surgical attention	Notes
	Bartlett	D'Anjou		
1930	None	None	None	
1931	8	392	None	
1932	12	63	150	
1933	6	44	25	Some of these 25 trees had been treated in 1932
1934	3	33	None	No new cases in 1935
1935	None	None	None	

The orchard now seems to be in fine shape and is making excellent growth.

BEAN AND PEA DISEASES IN COLORADO IN 1935

W. J. Zaumeyer and B. L. Wade

Bean Diseases

Examination of bean fields for the several diseases were made only in Weld County in Northwestern Colorado. The garden-bean acreage in this section was very much less than in other years, comprising less than 1000 acres. The field-bean acreage on the other hand was considerably increased over 1934, comprising about 96,000 acres. The varieties grown were Pinto, Robust, and Great Northern. Observations for disease occurrence were made during July and August. The amount of disease was less in 1935 than it has been for a number of years, which, together with favorable growing conditions, resulted in increased production.

Blight (Bacterium phaseoli) was not widespread and caused only a slight reduction in stand and yield. Most of the infection noted was seed-borne, producing the symptom commonly known as "stem girdle." The infected seedlings died early in the season and because of high temperature and relatively low humidity, comparatively little secondary spread was in evidence. Most of the seed or garden-bean acreage was free from bacterial blight due to the fact that much of the seed originated in Idaho where blight has never been a factor. Unlike other years, the "halo blight," caused by Bacterium medicaginis phaseolicola, was unimportant and difficulty was experienced in

finding plants infected by the organism. This is possibly attributable to the high temperatures prevailing during the summer.

Root rots (Fusarium and Rhizoctonia sp.) caused no reduction in stand or yield in any of the plantings examined, although diseased plants were occasionally found.

Rust (Uromyces appendiculatus). No rust was observed in any of the fields examined, although a high percentage of the acreage was planted to susceptible varieties. This disease has not been found to any extent since 1928, when it caused a considerable amount of damage destroying a high percentage of the Pinto bean acreage.

Mosaic (virus) was observed in many fields infecting as many as 25 to 35 per cent of the plants of susceptible varieties but with only a small reduction in yield. Only a small percentage of the extremely susceptible varieties was planted which accounted for the minor importance of this disease.

Pea Diseases

Pea plantings were examined in Weld, Larimer, Alamosa, Conejos, Costilla, Eagle, and Las Animas Counties. In Weld County most of the peas are grown for canning, while in the other counties the majority of them are produced for market.

Root rot (Fusarium martii var. pisi). Traces of root rot were noted wherever peas were examined, however no appreciable loss resulted. The damage from this disease was less than in 1934, which may be attributed to the increase of irrigation water over last year. In Las Animas County, infection was rather high and caused a considerable reduction in stand in a few fields.

Bacterial blight (Bacterium pisi), which was widespread in 1934 in the San Luis Valley section, was very limited in its distribution this year. A trace was found in Costilla and Las Animas Counties causing a slight reduction in marketable pods.

Pod spot (Ascochyta pisi) was noted only to a very limited extent in a small planting in Larimer County. In the other counties it was not observed to be a factor.

Mosaic (virus) was not found prevalent in any of the counties except Eagle and Las Animas. In the former county as much as twenty per cent of the plants of certain fields were infected with a slight reduction in yield. The disease was believed to have been spread by aphids from infected clovers, especially the red, white, and sweet-clovers which were found abundantly along the roadways, irrigation ditch banks, and fence rows. In Las Animas County less mosaic was found than in 1934.

Powdery mildew (Erysiphe polygoni) was found to only a limited extent causing a very small reduction of marketable peas due to spotting of the pods. The use of sulphur dust as a control has become so widespread that the disease seldom becomes a factor in the pod-pea growing sections. Later in the season after picking and control measures are discontinued the disease is usually widespread.

Sun Scald (non-parasitic) was found prevalent in some fields in the San Luis Valley, causing some spotting of the pods, leaves and stems. Badly spotted pods are culled out. (Division of Fruit and Vegetable Crops and Diseases)

LOSSES FROM CORN EAR ROTS IN ILLINOIS IN 1935

L. R. Tehon and Benjamin Koehler

The loss caused by Diplodia including ear and stalk rots, is estimated at 1.1 per cent. The prevalence of other organisms causing ear rot and the losses due to them are shown in the following table (Table 9).

Table 9. Schedule of losses from corn ear rots, other than Diplodia, in Illinois in 1935.

Organism causing rot	Field prevalence: % of ears infected	Estimated loss in % of counted ears
Fusarium spp. (chiefly F. moniliforme)	22.04	3.00
Gibberella saubinetii	0.94	0.08
Nigrospora sphaerica (Basisporium rot)	0.76	0.34
Aspergillus	0.04	0.04
Rhizopus	0.97	0.09
Penicillium	2.30	0.23
Total	27.05	3.78

(Based on data in the files of the Section of Applied Botany and Plant Pathology, Illinois State Natural History Survey, showing the prevalence of rots in 15,880 ears counted in 78 widely distributed fields.)

TESTS WITH COTTON WILT IN ARKANSAS, 1935

V. H. Young

The following data on cotton wilt (Fusarium vasinfectum) includes counts on only a few of the varieties studied in 1935 of which there were 32 at Marianna and 18 at Ozark. Counts on these same varieties in 1934 have been given in the Reporter (19:37. Apr. 1, 1935).

Data on Counts of Cotton Wilt in Arkansas, 1935

Variety	Cotton wilt Per cent
Ozark, Western Arkansas	
Half and Half	34.00
Rowden 5056	14.72
Trice 304	15.30
Rhynes Cook	1.41
Clevewilt 33-6	1.69
Startex	15.79
Super Cleveland	17.18
Marianna, Eastern Arkansas	
Half and Half	50.00
Acala 120-25	33.22
Dixie 14-5	1.45
Arkansas 17	3.94
Lightning Express 8	1.39
Rhynes Cook	.87
Rowden 4046	2.18
Hi Bred	22.92

Below are given a few figures from some of our work at Marianna showing the effect of potash fertilizer on the incidence of cotton wilt in Rowden 2088, a variety with considerable resistance, and in Missdel, a very susceptible variety.

Effect of Potash Fertilizer on the Incidence of Cotton Wilt at Marianna

Treatment	Variety	Wilt Per cent
Check - unfertilized	Rowden 2088	8.47
	Missdel	28.31
340 pounds Kainit per acre	Rowden 2088	.31
	Missdel	6.8

(Arkansas Agr. Exp. Sta.)

SOME OBSERVATIONS ON TOBACCO DISEASES IN NORTH CAROLINA IN 1935

R. F. Poole

A Soft Rot of Tobacco Caused by Bacillus carotovorus: The bacterial soft rot of tobacco occurred throughout the eastern counties of North Carolina on July 8 to 20. The disease was caused by Bacillus carotovorus, or a related species. The infection was mostly through fresh wounds made in topping and suckering. Light yellow to brown lesions occurred on the petioles of leaves near the stalk. The injury at this point weakened the petiole causing the leaf to fall to a hanging position along the stem. The rib and main veins blackened as the tissues softened. Sometimes the soft decay was sufficient to release the stem from the stalk. A soft watery decay developed rapidly in the stem. The tissues darkened as they dried, leaving hollow stalks. The diseased plants always occurred during wet weather, and in isolated areas. The losses in scattered fields amounted to 1 per cent of the plants. Bacteria oozed from the surface of lesions on the stalk, but secondary infections were rarely seen.

Leaf Scalds on Tobacco: During the week beginning June 5, 1935, and on approximately the same dates in other years, county agents have reported losses in tobacco due to sun scald. The injury occurs on leaves of plants affected with the mosaic disease and on plants that are very vigorous and succulent during high temperature periods in June.

On plants diseased with mosaic, the leaves near the center of the plant and those exposed to the direct rays of the sun develop near the center of the leaf bleached to bronzed spots that extend entirely across the mid section. All tissues in this region break down finally. If conditions remain dry the dead tissues dessicate and break out leaving a ragged and worthless leaf. If conditions remain damp all tissues turn black and sometimes the entire leaf is destroyed. This form of injury is definitely related to plants affected with the mosaic disease. This symptom may occur even after the other mosaic symptoms become masked.

The other type of blister developed on plants that were growing vigorously during the hot weather early in June. It was found on plants transplanted later than the regular planting dates. Leaves near the center of the plant developed in the angles adjoining the mid rib a brown dessicated area ranging in size from one-fourth to two inches in diameter. Sometimes three or more spots of this type developed in the intercostal area between the same large veins. The dead tissues were finally released from the green tissue, leaving holes of various types. The period favorable for the development of this condition has not exceeded ten days in any season in which it has been reported. (North Carolina Agr. Exp. Sta.)

FIGHT AGAINST DUTCH ELM DISEASE CONTINUED THROUGH SNOW AND SLEET

Vulnerable elm trees--nearly one and one-half million of them in the area threatened by the Dutch elm disease (Ceratostomella ulmi)--were found and marked for destruction by Government crews that kept on the job right through severe winter weather. Vulnerable elms are not necessarily infected with the Dutch elm disease, says Lee A. Strong of the U. S. Department of Agriculture. They are elms that are not thrifty and in vigorous growth, perhaps because of insect or fungus pests, or perhaps because they are not well nourished. These are likely to be attacked by the Dutch elm disease and must be destroyed to safeguard the healthy vigorous trees. The crews have marked for destruction 1,470,680 trees since the U. S. Department of Agriculture, in 1933, started its campaign to save the American elm from extinction. Of these, 1,064,707 trees have been removed. Laboratory tests confirmed the presence of the infection in 14,233 trees. All but four of these have been destroyed according to the latest progress report to the Bureau of Entomology and Plant Quarantine.

The field of operation against the Dutch elm disease has been extended from time to time as new cases of infection have come to light outside the original 5,000 square miles in New Jersey, Connecticut, and New York, centering around New York City. Scouting and clean-up crews--comprising enrollees from Civilian Conservation Corps Camps and W. P. A. workers--now operate over 3,620 square miles in New Jersey, 2,214 square miles in New York, 728 square miles in Connecticut, 89 square miles in Pennsylvania, and 35 square miles in Ohio.

It would be impossible to estimate in terms of dollars and cents the value of the trees endangered by the Dutch elm disease, accidentally brought into this country in 1930, Mr. Strong says. There are no figures showing the extent of commercial stands of elm east of the Mississippi. The annual cut of elm decreased from 450,000,000 board feed in 1900 to 20,000,000 board feet in 1932. The disease, however, has not yet reached these commercial stands. The area where it is now present contains about 25,000,000 elms, of which 5,000,000 are shade trees having a value far beyond their commercial worth. (From U. S. Dept. Agr. Press Release, March 9).

AN EARLY RECORD OF SEPTORIA LEAF SPOT OF PEONY IN OREGON

S. M. Zeller sent to this Division a specimen of Septoria paeoniae Westd. var. berolinensis Allesch. on peony, collected by H. P. Barss at Troutdale, Multnomah County, Oregon, July 23, 1914. This seems to be the earliest record of the occurrence of the fungus in the Far West. A Septoria on peony, reported as S. paeoniae Westd. was found in Washington as early as 1927.

OBSERVATIONS OF INTEREST ON NEMATODE DISEASES OF PLANTS

G. Steiner and Edna M. Buhrer

New Hosts for the Root-Knot Nematode

Examination of material submitted to us proved the following plants to be new hosts of the root-knot nematode, Heterodera marioni (Cornu) Goodey.

1. EUPHORBIA PUNCTATA
2. ECHEVERIA sp.
3. KALANCHOE sp.

} from South Africa, received through the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture.

4. ROSA ODORATA
5. SENECIO CRUENTUS, Cineraria

} from a local greenhouse.

6. DRACAENA sp. Hort. vars. Lord Wolseley and Terminalis
7. DRACAENA FRAGRANS Hort. var. Massange

} from Florida.

8. PELARGONIUM HORTORUM, Fish geranium, from Ohio.

9. DIGITARIA SANGUINALIS, Crabgrass
10. CYPERUS COMPRESSUS

} from North Carolina, through the courtesy of E. C. Clayton.

11. CHRYSANTHEMUM COCCINEUM Hort. var. Eileen May Robinson

} from England, through the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.

12. ANEMONE NEMOROSA, European wood anemone, from Holland, through the U. S. Department of Agriculture Inspection House.

13. HYSSOPUS OFFICINALIS, a mint grown in Michigan from seed collected in India, through the U. S. Department of Agriculture Inspection House.

CHRYSANTHEMUM CINERARIAEFOLIUM, a host newly noted for this country, was grown in Maryland, and received through A. F. Sievers.

Occurrence of the Meadow Nematode

The meadow nematode, Anguillulina pratensis (de Man), has been observed in plant roots rather frequently during the past year, the following instances being noteworthy:

1. Apple tree roots, MALUS sp., from California, through the courtesy of C. E. Scott.

2. Seedlings of the Chinese elm, ULMUS PARVIFOLIA, from Oklahoma, through the courtesy of H. Lamb and R. W. Davidson.

3. STEVIA sp. from New Jersey.

4. CHRYSANTHEMUM sp. from New Jersey.

5. Corn, ZEA MAYS, from Florida and South Carolina (root-knot was also found in the latter).

6. Tobacco, NICOTIANA TABACUM, from South Carolina.

7. SOLIDAGO LEAVENWORTHII
8. SOLIDAGO SEROTINA, November goldenrod
9. SOLIDAGO FISTULOSA
10. SOLIDAGO ALTISSIMA, Tall goldenrod
11. SOLIDAGO NASHII
12. SOLIDAGO ELLIOTTII
13. SOLIDAGO EDISONIANA
14. SOLIDAGO RUGOSA, Wrinkled goldenrod
15. SOLIDAGO SEMPERVIRENS, Seaside goldenrod

} from Florida, through the courtesy of H. G. Ukkelberg.

Observations on Other Nematodes

The bulb or stem nematode, Anguillulina dipsaci (Kühn), has been noted on a number of horticultural varieties of TIGRIDIA PAVONIA, common tigerflower, from Holland, intercepted at the U. S. Department of Agriculture Inspection House.

Heavy infestations of Cephalobus elongatus de Man have been observed in two instances of late: In Katahdin potatoes (SOLANUM TUBEROSUM), through the courtesy of L. C. Cash, and in leaves of IRIS OCHROLEUCA, Yellowband iris, through F. Weiss. Both plants originated on Long Island, N. Y. (Division of Nematology).

CURRENT REPORTS ON PLANT DISEASES

LATE BLIGHT AND BACTERIAL SOFT ROT OF POTATO IN FLORIDA THIS YEAR: Late blight (Phytophthora infestans) appeared in the potato fields of the Homestead area this season as the vines were approaching maturity. The disease was first noted on potato foliage February 6, and within two weeks could be found in practically every field visited. The weather during the period from February 6 to February 22 was very favorable for the rapid development of the disease, being cloudy and humid with frequent showers and relatively cool temperatures.

There was probably little reduction in yield from the foliage blight because of its late appearance, but considerable losses are now being sustained from the tuber rot phase of the disease, which began to appear about February 24.

Bacterial soft rot developing in the fields prior to harvesting the crop is also much more prevalent this season than in preceding years. In many cases the bacterial soft rot is following the late blight tuber rot and is rapidly completing the disintegration of the tubers, but it is also quite prevalent in fields where comparatively little late blight is found. Losses from bacterial soft rot in the field range from an estimated 1 to 2 per cent in plantings on higher ground to 10 to 15 per cent in fields where the soil has remained excessively wet since the February rains. (George D. Ruehle, Florida Agr. Exp. Sta., March 5).

DOWNY MILDEW OF TOBACCO IN GEORGIA: Downy mildew (Peronospora tabacina) was observed in two beds in Berrien County. In one of them the development of the disease indicated that it had been present at least ten days. Reports indicate scattered infection in this area, but the disease is not yet general. (J. G. Gaines, Division of Tobacco and Plant Nutrition. Mar. 4).

PHYTOPHTHORA ROOT ROT OF CALLA LILY IN LONG ISLAND GREENHOUSES: Root rot (Phytophthora richardiae) of calla lilies is causing considerable trouble in greenhouses. (Mary K. Peters, State Institute of Applied Agriculture on Long Island, Farmingdale, L. I. March 9).

THE COLD WINTER OF 1935-36

(The accompanying maps and summary of the weather of the winter just past are taken from the Weekly Weather and Crop Bulletin, series 1936, no. 10, for the week ending March 10.)

In very great contrast to recent winters, the one just ended (December-February), was abnormally cold throughout the central and eastern portions of the country. For a number of preceding years the winters, in general, had been mild, especially the 5 years up to and including 1934-35. These five winters were much warmer than usual in practically all parts of the country; in the Central and Northwestern States averages were from 4° to 8° above normal.

The winter of 1935-1936 was one of the severest ever experienced in many districts, being the coldest of record in some northwestern sections. Figure 21 shows the departure of the mean winter temperature from normal. It indicates for all Central and Northern States between the Appalachian and Rocky Mountains a 3-month average of from 6° to as many as 12° below normal; thus in the northern Plains, for example,

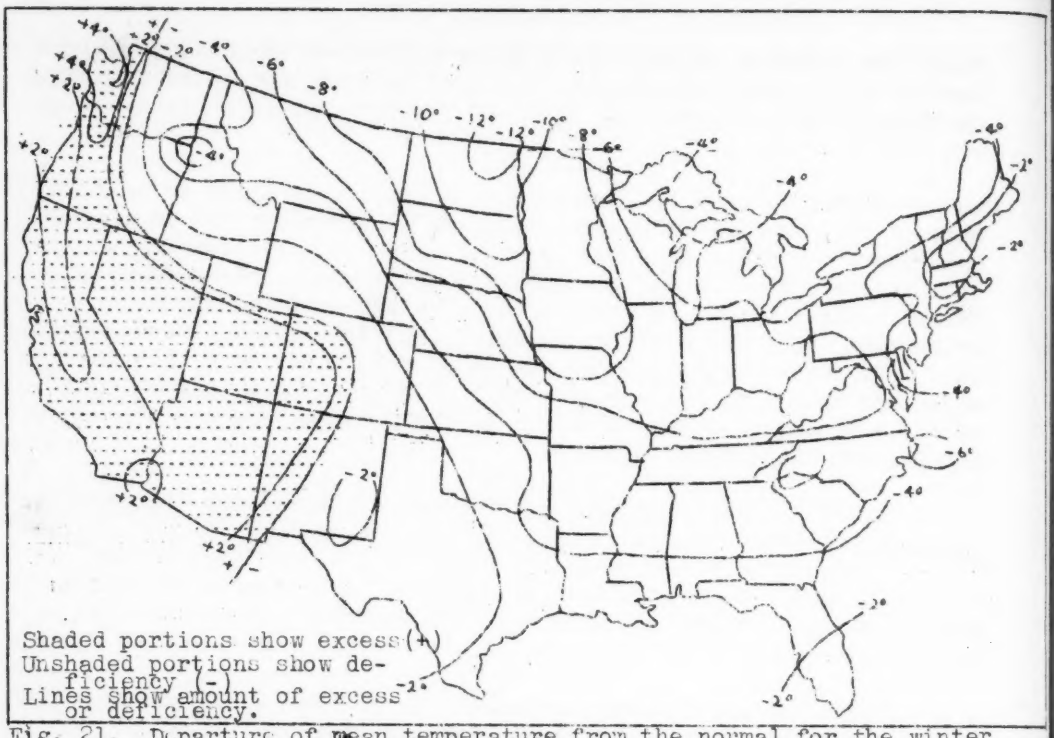

Fig. 21. Departure of mean temperature from the normal for the winter (December-February), 1935-36.

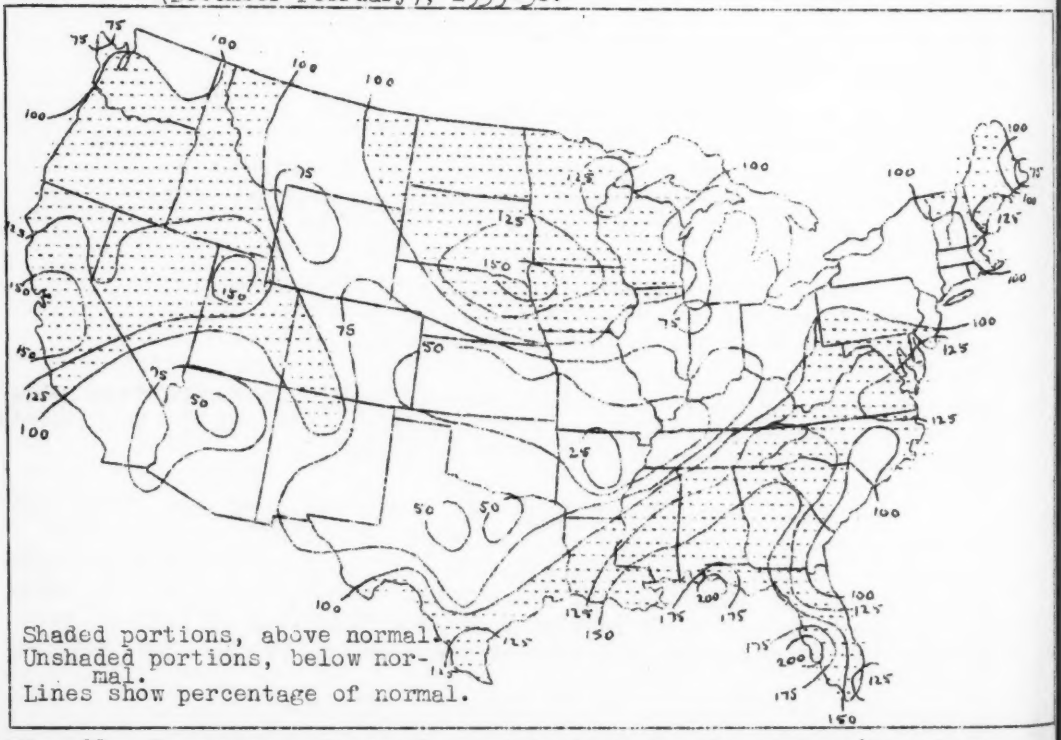

Fig. 22. Percentage of normal precipitation for the winter (December-February), 1935-36.

the past winter was from 15° to nearly 20° colder than the average for the preceding five winters. However, a considerable area in the far Southwest had a somewhat warmer than normal winter.

The coldest weather occurred during a period of about 30 days ending around February 20, during which the temperatures were persistently low, as indicated by the following notes from the records of several first-order stations: At St. Louis, Mo., the average temperature was about 4° lower than the previous coldest 30-day period; at Kansas City, Mo., the 30-day average, ending February 21, was 8°, and at Detroit, Mich., 13°; at St. Joseph, Mo., the average for the 30 days ending February 20, was 7° lower than the previous low record, while at Topeka, Kans., it was about 3° lower than the record winter of 1887-1888. At Huron, S. Dak., the temperature was continuously below zero from February 3 to 19, while at Bismarck, N. Dak., it was below zero constantly for 15 days. At Williston, N. Dak., the highest temperature recorded between February 5 and 17, was 9° below zero, the lowest 50° below, and the average for 13 days, 26° below zero.

At Devils Lake, N. Dak., there was established a winter-temperature record that probably has no parallel in the weather history of this country for a first-order Weather Bureau station. At this place the temperature went below freezing on November 27 and did not thereafter rise to the freezing point until March 1, a period of 96 days. For 37 days, January 14 to February 19, there was only one day on which the thermometer registered as high as zero, while the week ending February 17, had an average temperature of 28° below zero; the average for 2 months--January and February--was 13° below zero.

Figure 22 shows the percentage of normal precipitation for the three winter months. Precipitation was heavy from the middle Atlantic area southwestward to the Gulf, and considerably above normal in most sections between the Lake region and the Rocky Mountains; also in central and northern districts west of the Rockies. On the other hand, it was markedly deficient from the lower Ohio Valley westward to the Rockies, and also in a limited area of the far Southwest.